


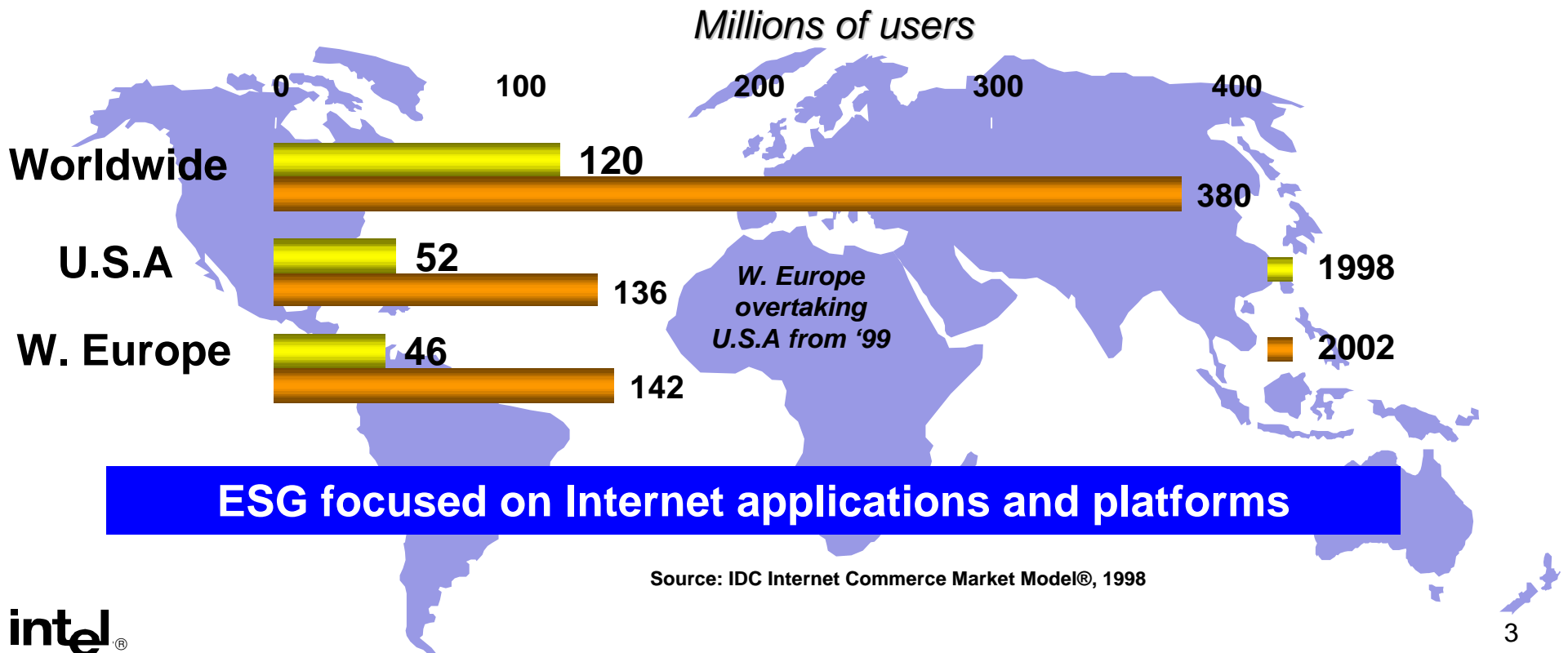
# **Winning with Foster- based Servers**

# Agenda

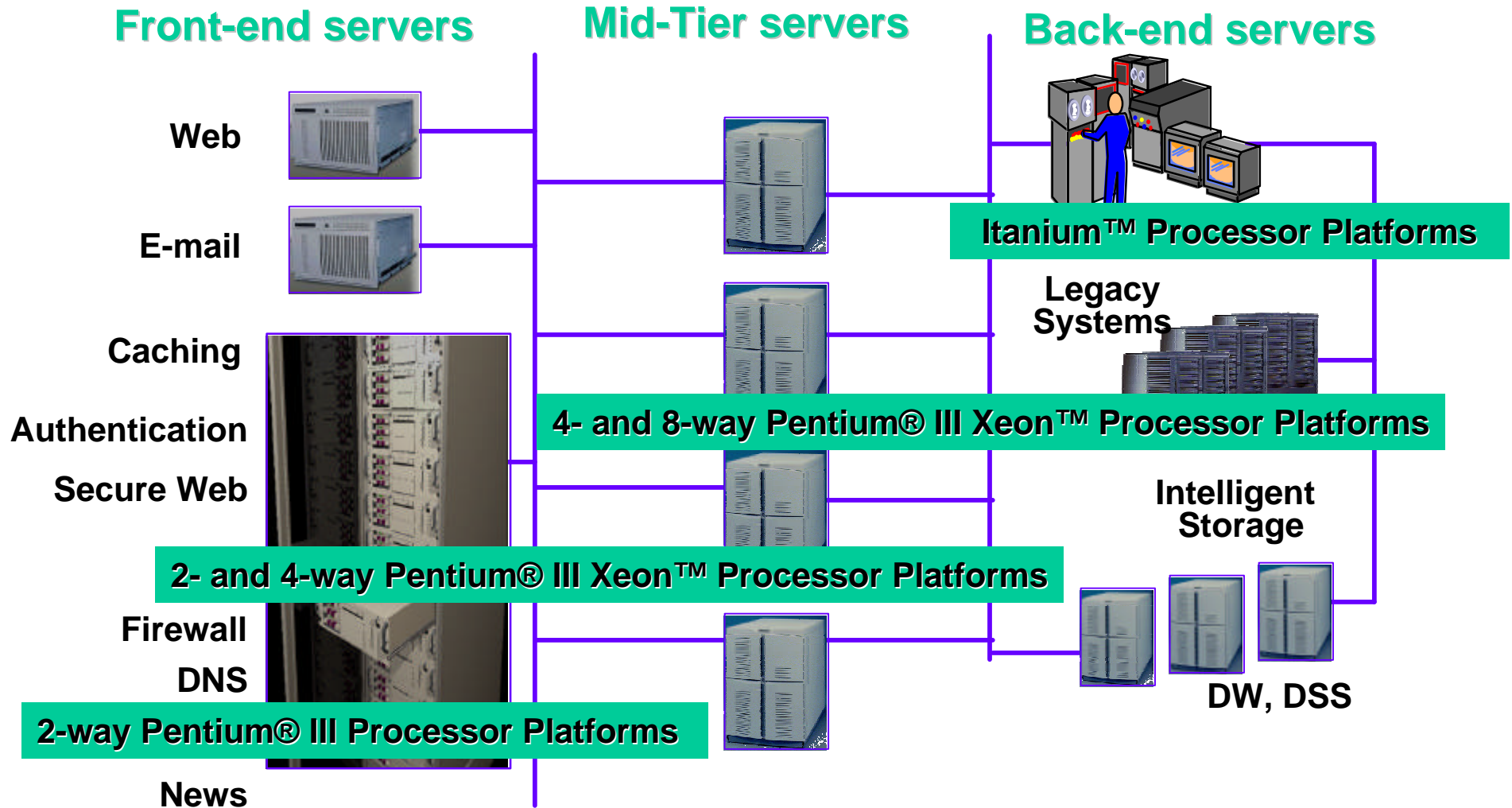
- 
- **Server Market Overview**
  - **Roadmaps & Positioning**
  - **Foster Processor**
  - **SPD Platforms**

# Internet Drives Server Growth

- **Front-end servers: 1u/2u is gaining momentum**
  - Low-profile, high-density rack mount for web hosting, firewall, caching, proxy
- **Mid-Tier servers: 4-way and 8-way provide performance, headroom and scalability needed for high growth e-Business**
- **Back-end servers: 8-way delivers on performance requirements *TODAY***
  - IA-64 to meet the needs of the most demanding Back-end applications



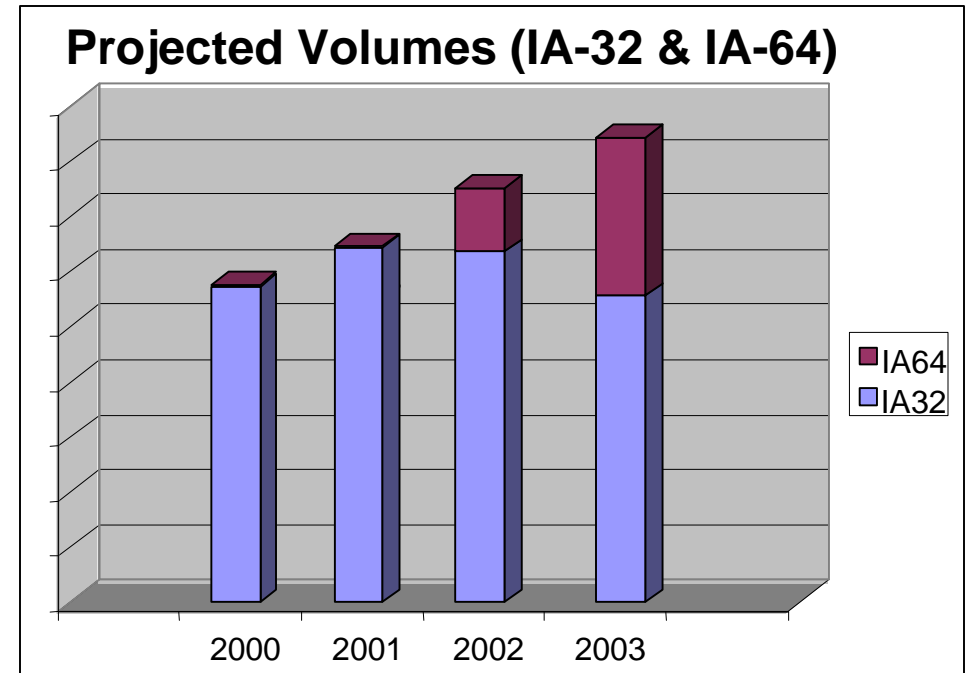
# Internet Server Specialization



**A variety of servers for all e-Business needs on Intel Architecture**

# IA-32 & IA-64 Coexistence

- **Pentium® III Xeon™ servers fill *today's* needs**
  - Supports the needs for current e-Business environments
  - Provides the headroom and scalability with 2-, 4- and 8-way systems to support growing demands
- **Itanium™ processor-based servers to meet the *future* needs of e-Business**
  - Improved memory scalability
  - Greater OS & application choice for enterprise environments
  - Architectural features for new e-Business capabilities (predication, speculation and inherent parallelism)
- **Complete IA-32 & IA-64 solutions**
  - Co-existing server environments for comprehensive e-Business solutions



Source: IDC Server Hardware Market Forecast June'99

**IA-32 products will continue with strong volumes**

# Why IA Server Platforms?

- **Enterprise-class solutions and features**

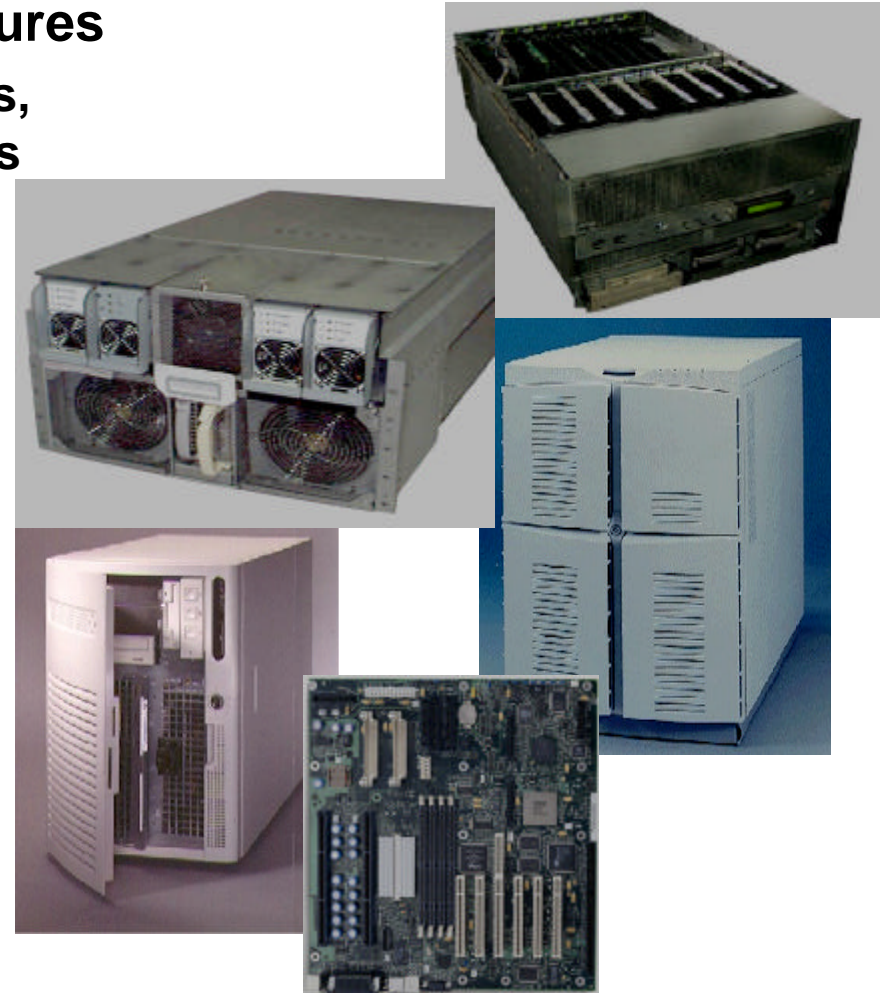
- **Broadest base of Operating Systems, Applications and Development tools**

- **Reliability & Manageability Features**

- ECC
    - SM Bus
    - RAID
    - Server Management
    - Redundant PS, Fan, HDD
    - Hot Swap PCI

- **Scalability and Performance**

- Large cache
    - ESMA large memory support
    - Upgradeability
    - Clustering



**Scalable, reliable, high performance servers at SHV prices**

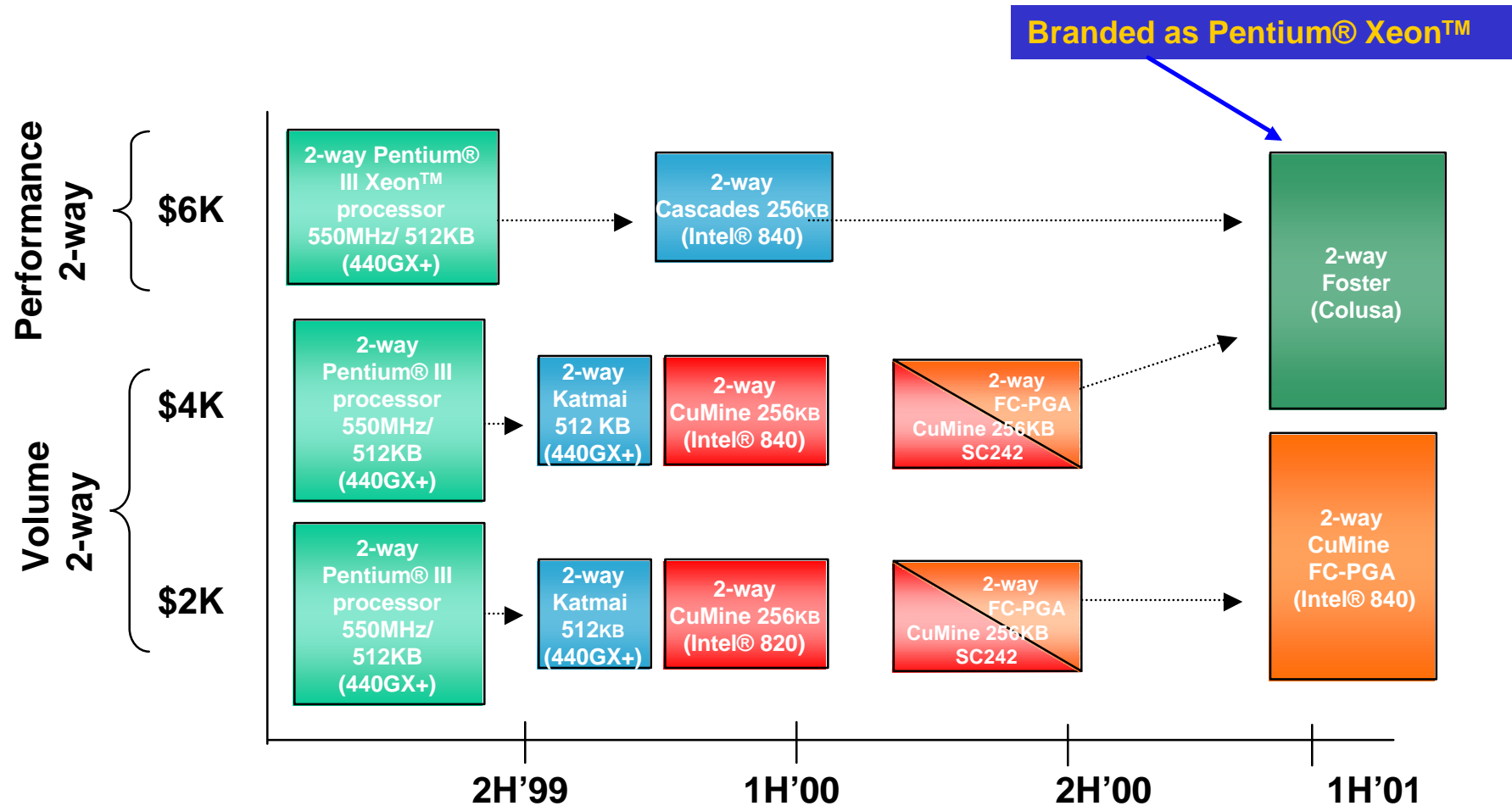
***Show Intel® Xeon™  
Processor Testimonials  
(eToys\*) Video (3 min)***

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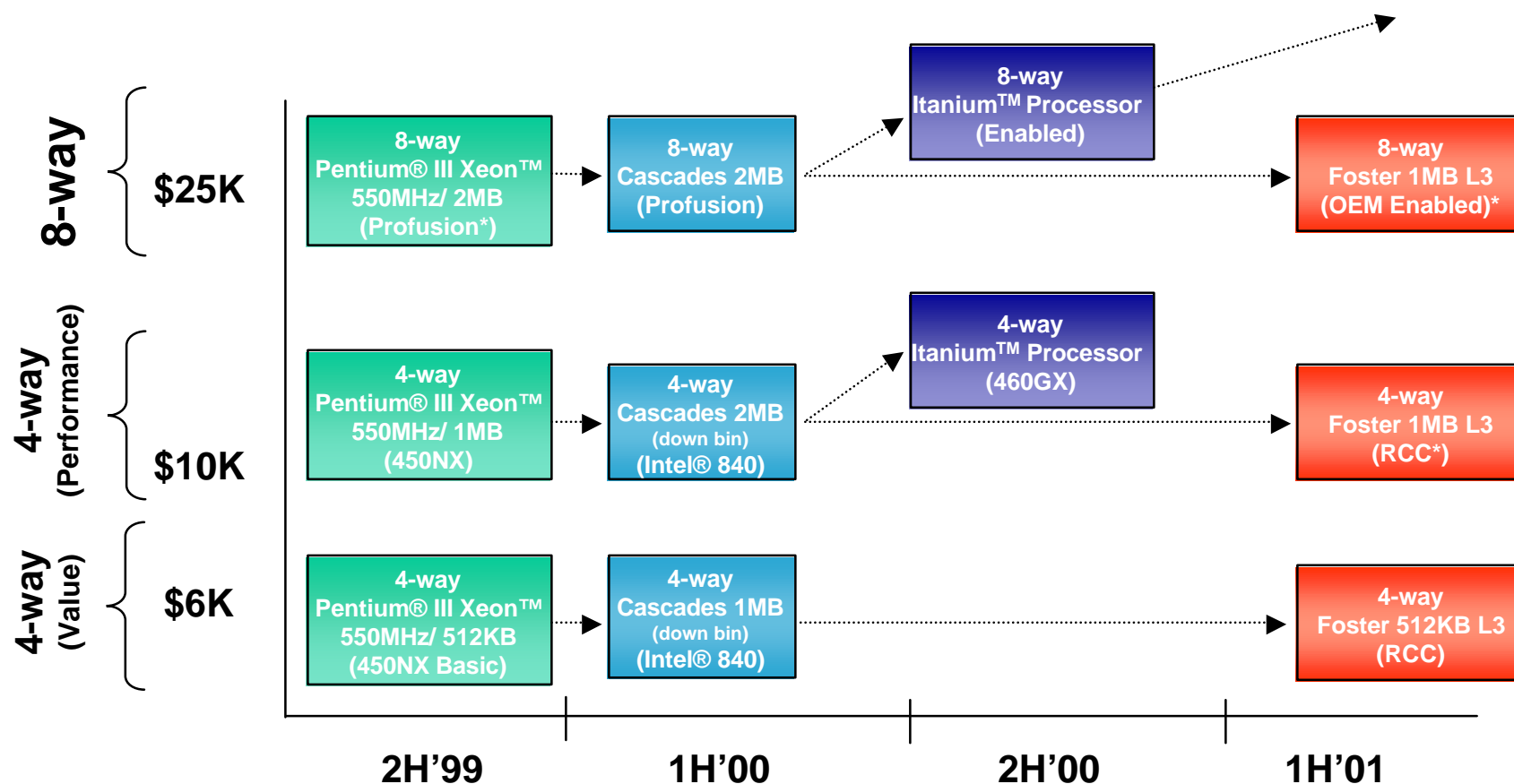


# 2-way Server Roadmap



Moving Intel® Xeon™ processor further into the DP server space with Foster

# 4-way & 8-way Server Roadmap



*\*Intel® 870 in 2H'01*

**IA-32 and IA-64 platforms will co-exist**

# Foster Server Platform Positioning

- **A variety of Foster-based servers and options for different market segments**
  - **Intel® 870 & OEM custom chipsets** for 8-way and greater (Foster 1MB)
    - Custom solutions for 8-way & greater in 1H'01
    - Intel® 870 available in 2H'01 supporting 64GB DDR/RDRAM and PCI/ PCI-X and Infiniband\*
  - **RCC\*** for entry 4-way & performance 4-way (Foster 512KB)
    - 4-way TTM, available in Q1'01 supporting 32GB DDR1 and PCI/PCI-X
  - **Colusa** for performance 2-way (DP Foster)
    - 2-way TTM, available in Q4'00 supporting 4GB RDRAM/SDRAM and 64/66 PCI

**A breadth of Foster-based server solutions to meet various market segment needs**

# Foster Positioning FAQs

**Q: Why is Willamette not on the server roadmap?**

**A:** Willamette is UP only. The server roadmap in this time-frame will be DP or greater. Plus, DP CuMine FCPGA and DP Foster servers offer better price/performance and raw performance.

**Q: How far down into the 2-way space will Foster go?**

**A:** DP Foster will be for the general purpose and 2u+ front-end server systems. DP CuMine FCPGA will be targeted for the highest density, lowest profile (ie 1u) front-end servers. There is projected to be a substantial performance delta between Foster/CuMine FCPGA (unlike Cascades/CuMine today).

**Q: How will the DP Foster SKU be priced?**


**A:** The pricing model for Foster/Willamette will be similar to the one used for Cascades/256k and CuMine.

**Q: Why Colusa for 2-way Foster servers?**

**A:** Colusa is the only chipset that is TTM with DP Foster in Q4'00. In addition, it is the only Intel validation vehicle. With the performance leap offered by Foster-based servers, OEMs will want to be TTM with DP Foster (and not risk losing segment share).

**In the Foster time-frame, Servers = DP capable or greater**

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# Foster Overview

- **Foster is the next generation IA-32 processor**
  - New 603-PGA (socket) form factor
    - Based on 0.18 $\mu$  process
  - Leading IA-32 product, with launch speed of 1.4 GHz
    - Substantially improved performance over P6 family
  - Fast quad-pumped (400MHz) system bus
- **Positioning**
  - Willamette for UP desktop and workstations
  - Foster for DP & MP server and workstations
- **Schedules**
  - Willamette & DP Foster in Q4'00
  - MP Foster (512KB/1MB) in Q1'01

**A new micro architecture and improved server performance**

# The Foster Processor Advantage

## 400MHz System Bus

Faster data bus for improved performance

## Jackson Technology

Multi-threading

## L3 Cache (on-die)

Large L3 cache (512KB, 1MB) for improved performance

## Willamette New Instructions

Double precision SSE

## Pentium® Xeon™ Processor Extended Product Life Policy

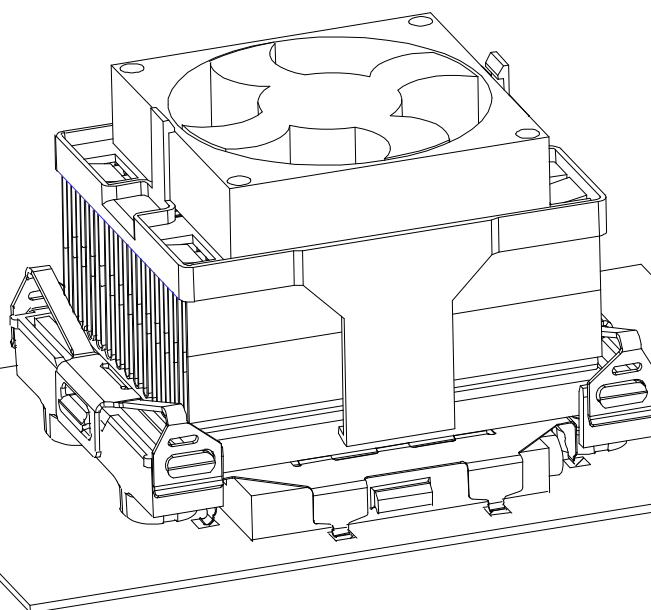
2x platform life over desktop processors

## High Performance

Fastest IA-32 processor at 1.4GHz

## Affordable Prices

DP capable only SKU near desktop prices



**New and enhanced features for Foster-based servers**

# Server Software Enabling for Foster

- **Key Foster Software features**
  - Jackson Technology
    - Multi-threading
  - Willamette New Instructions
    - Double-precision SSE
- **ISV/OSV engagement underway**
  - WNI optimization started with key ISVs in Q2'99
    - 4 WNI apps enabled at launch
  - Jackson Technology tuning requires silicon (1H'00)
    - 20 Jackson Technology apps enabled at launch
  - OSV status
    - Windows 2000\*, Monterey\*, Netware\*, Linux\* disclosures done

**Key ISV/OSV enabling for Foster servers underway**



# Foster Server Software Benefits

<u>Feature</u>	<u>Target Segments</u>	<u>Start Work</u>	<u>ISV Effort</u>
<b>Jackson Technology</b> <i>(Muliti-threading)</i>	Database Data Warehouse ERP Directory servers Cache servers	Post-silicon (Q1'00 - Q1'01)	Difficult to identify Minor code changes
<b>Willamette New Instructions</b> <i>(SIMD Double Precision Floatinng Point &amp; Integers)</i>	Data warehouse Scientific/technical Security Speech recognition Streaming media	Pre-silicon (Q2'99 - Q4'00)	Easy to identify Lots of coding work

**Enhanced server performance with Jackson Technology  
& Willamette New Instructions**

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# Juniper (2-way Foster Server)

- **Juniper/Hudson II POR**
  - Targeting product launch TTM with DP Foster - Q4'00
  - Will use Colusa
  - Final POR set in March, following DIA (Design Investment Approval)

## Feature Set Summary

- 2-way Foster
- Colusa chipset
- Modular Memory Board with 4GB SDRAM support (with 2-way interleaving)
- Triple Peer PCI Busses (1,200MB/Sec PCI Bandwidth)
  - 6 total PCI slots (2x64/66MHz, 3x64/33MHz, 1x32/33MHz)
- Integrated Dual Channel Ultra-160 SCSI
- Integrated Sahalee Server Management



*Hudson II Tower and Rack*

**Juniper with Colusa TTM with DP Foster in Q4'00**

# Shasta (4-way Foster Server)

- **Shasta/Cabrillo III POR**
  - Targeting product launch TTM with MP Foster - Q1'01
  - Will use RCC\* chipset (Grand Champion)
  - POR set in February, following DIA

## **Feature Set Summary**

- **4-way Foster-based server**
- **RCC chipset**
- **Quad peer PCI busses**
  - 3 64/66, 1 64/33 peer hot-plug PCI busses,
  - 8 total PCI slots (6x64/66MHz, 2x64/33MHz)
- **2 x Ultra-160 LVDS SCSI and 1 x Ultra Legacy SCSI**
- **Advanced Server Management (Sisters/Mazama)**
- **IPMI, APCI, WFM, Server '00 Compliant (HDG 3.0)**



*Cabrillo III Tower and Rack*

**Shasta with RCC TTM with MP Foster in Q1'01**

# OEM Opportunities

- **Use Intel premium branding to maximize server business**
  - Continue successful 8-way ramp with Foster in 1H'01
    - Focus on server consolidation, e-Business data base and DSS solutions
    - Enhanced 8-way Pentium® Xeon™ processor promotion campaign and IIP incentives
  - Ramp existing and new 4-way Foster processor-based designs
    - 4-way Foster servers will provide a substantial performance boost over Cascades servers
  - Grow 2-way Pentium® Xeon™ processor segment with DP Foster
    - For corporate customers requiring long lived, stable platforms at 2-way general purpose server price points
    - Foster pricing encourages broad adoption of 2-way Pentium® III Xeon™ processor-based systems

**Ensure OEM Foster servers are ready for launch**